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PARADIGMATIC-SYNTAGMATIC WORD ASSOCIATION
AND ITS RELATIONSHIP TO GRADE
ONE READING ACHIEVEMENT

by



CLIFFORD GEORGE OTTO

A THESIS

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ABSTRACT

The teaching of reading and learning of appropriate reading programs requires a knowledge of each child's level of ability in the use of oral language because the proficiency and amount of oral language which a child learns to read as well as the degree of success he experiences. This would necessitate a means of quickly and accurately determining the child's level of oral language performance. The instrument of phonics which was developed and used in this study was designed to determine if a relationship between phonics and oral language performance existed.

To Connie, Kelty, and Carla

The sample consisted of 70 grade one pupils drawn from three different schools in the St. Louis area. The age of the pupils ranged from 6 to 7 years. The pupils were drawn from high, middle, and low socioeconomic levels. The pupils were given a typical reading test and a phonics test. The results of the tests were compared to determine if a relationship existed between the two.

The results of the study indicated that there was a significant relationship between the two. The results of the study indicated that there was a significant relationship between the two. The results of the study indicated that there was a significant relationship between the two. The results of the study indicated that there was a significant relationship between the two.

ABSTRACT

The teaching of reading and planning of appropriate reading programs requires a knowledge of each child's level of ability in the use of oral language because the proficient use of oral language by children has been identified as an important factor in the ease with which a child learns to read as well as the degree of success he experiences. This would necessitate a means of quickly and accurately determining the child's level of oral language performance. The instrument used would also require a proven relationship to reading achievement. This study sought to determine if a relationship between paradigmatic-syntagmatic word association, as a measure of oral language performance, and grade one end-of-year reading achievement existed.

The sample consisted of 70 grade one pupils drawn from three different schools in the Edmonton Public School System. The age of the 36 males and 34 females ranged from 74 to 99 months. Children were drawn from high, middle, and low socio-economic areas to obtain a typical cross-section of grade one students. Intelligence was not used as a factor in the selection of the sample.

The Oral Paradigmatic/Syntagmatic Language Inventory was administered and scored by this investigator to determine the children's level of oral language performance. Reading achievement was measured by means of the Stanford Achievement Test, Primary 1, Form X, which was administered and scored by the classroom teachers.

The results of the two tests were subjected to statistical

analysis by means of the Pearson Product Moment of Correlation, analysis of variance, and a t-test. Computer programs made available by the Department of Educational Research Services were utilized for this purpose. The effect of age and sex were also considered.

The findings of the study indicated a positive relationship between the number of paradigmatic responses produced and general year-end grade one reading achievement. They suggest that paradigmatic-syntagmatic word association has some utility in linking the oral language of grade one children to their reading achievement.

Implications arising from these findings, which may be of interest to teachers of reading skills, are discussed. As well, several suggestions for further research, which arose from this study, are presented.

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Chapter 1

PURPOSE OF THE STUDY

Prominent figures in the field of reading consider a child's oral language proficiency to be directly related to the ease with which he learns how to read. Dechant (1970) states that to develop reading readiness in children, the development of oral vocabulary, syntax, and articulation must be fostered. Ruddell (1970) concurs with Dechant, stating that a critical factor in reading comprehension is the level of oral language vocabulary of the reader. Research supports a relationship between oral language and reading achievement (Strickland, 1962; Jensen, 1973; Mickleson, 1972). Bougere sums up her research in this area by saying:

There appears to be unanimous agreement among reading specialists, and specialists in allied fields, that beginning reading achievement is significantly related to oral language development [Bougere, 1968, p. 146].

If there is a strong association between oral language and reading achievement then it is important that ways are found to measure oral language output. Unfortunately, oral language output is seldom analyzed or used to determine appropriate early learning experiences aimed at improving the child's language so as to facilitate the acquisition of reading ability. One possible reason for this is the lack of easily utilized instruments for determining levels of oral language development. Most of the instruments devised for analysing oral language have required time consuming administration procedures. As well, analysis is often complex, requiring linguistic knowledge

beyond the capabilities of the classroom teacher who would be the most logical administrator of any screening test in this area. Further, these tests often investigate only the syntactical prowess of the child ignoring the semantic aspects of his oral language.

What is needed therefore is a relatively easily administered, easily analysed, reliable instrument for determining the level of children's oral language output which also has a proven relationship to children's reading achievement. One approach to this problem has been the use of paradigmatic-syntagmatic word association (P/S word association). Research has shown that the number of paradigmatic responses given by a child increases as the child matures. The pattern of paradigmatic-syntagmatic responses provides an indication of children's language development (Ervin, 1961 and 1963; Entwisle, 1964; McNeill, 1966). Further research has indicated that this conceptual framework can be related to children's reading achievement (Bickley, Bickley, and Cowart, 1971; Bickley, Dinnan, and Jones, 1971; Dinnan, Bickley, and Williams, 1971; Dinnan, Bickley, and Cowart, 1970-71). The instrument utilized in many of these studies was the Oral Paradigmatic/Syntagmatic Language Inventory (P/S Inventory).

STATEMENT OF THE PROBLEM

Paradigmatic-syntagmatic word association has been related to the reading readiness of beginning grade 1 children as well as the reading achievement of children in grades 2, 3, and 4. It has not been related to grade 1 reading achievement, nor has any work

been done in the area of relating P/S word association to a specific component or components (such as word recognition, vocabulary, etc.) of reading achievement. This study investigated the correlation between P/S word association and the over all reading achievement of grade 1 pupils. It also attempted to determine if there is a significant correlation between P/S word association and each of the following components of reading achievement: word reading, paragraph meaning, vocabulary, and word study skills. The effects of sex and age upon P/S word association were also considered.

RESEARCH QUESTIONS AND NULL HYPOTHESES

The following research questions guided the research undertaken in this study. To facilitate statistical analysis, null hypotheses were formulated for these research questions.

Research Question 1

Is there a significant correlation between level of performance on a P/S word association test and year end reading achievement for grade 1 pupils?

Null hypothesis 1. There is no significant correlation between the level of performance on a P/S word association test and year end reading achievement for grade 1 pupils.

Research Question 2

Is the level of performance on a P/S word association test most significantly correlated with the word reading aspect, the paragraph meaning aspect, the vocabulary aspect, or the word study skills aspect of the reading achievement of grade 1 pupils?

Null hypothesis 2. There is no significant difference among the correlations obtained for 1) P score and word reading, 2) P score and paragraph meaning, 3) P score and vocabulary, and 4) P score and word study skills.

Research Question 3

Is there a significant difference in the P/S word association performance and the reading achievement among grade 1 children of different age levels?

Null hypothesis 3. There is no significant difference in the performance of grade 1 children of different age levels in P/S word association and in reading achievement.

Research Question 4

Is there a significant difference between the level of performance of grade 1 males and grade 1 females on P/S word association and on reading achievement?

Null hypothesis 4. There is no significant difference between the level of performance of grade 1 males and grade 1 females in P/S word association, or in reading achievement.

DEFINITIONS

Certain terms having meaning specific to the purposes of this study are defined as follows:

1. P/S word association: Paradigmatic-syntagmatic word association. This is a dichotomy used to classify responses to a stimulus word in a word association test.

2. Paradigmatic: Any response to a stimulus word in a word association task which could effectively replace the stimulus word in a sentence. It is usually of the same form class i.e. noun,

verb, etc., and illustrates one of the following relationships:

- a) superordinate: stimulus: apple
response: fruit
- b) co-ordinate: stimulus: arm
response: leg
- c) contrast: stimulus: black
response: white
- d) whole-part: stimulus: branch
response: tree

(Bickley, Bickley, and Cowart, 1971, p. 11.)

Paradigmatic responses are classified as higher order responses produced by subjects with a more fully developed capacity for oral language.

3. Syntagmatic: Any response to a stimulus word in a word association task which is not paradigmatic. These responses are usually words which would immediately precede (stimulus--car, response--red) or follow (stimulus--man, response--walks) the stimulus in a sentence.

4. Clang response: A response which retains the initial sound or sounds of the stimulus word (she-sheep) or the final sound or sounds of the stimulus word (pin-bin).

5. P/S Inventory: Oral Paradigmatic/Syntagmatic Language Inventory. This is an experimental word association test developed by Bickley, Dinnan, and Bickley (1970). See Chapter 3 for a further description.

6. P score: The number of paradigmatic responses to the P/S Inventory.

7. S score: The number of syntagmatic responses to the

P/S Inventory.

8. SAT: Stanford Achievement Test, Primary 1, Reading Tests, Form X. See Chapter 3 for a further description.

ASSUMPTIONS

1. It is assumed that the SAT is a valid measure of reading achievement at the grade 1 level.

2. It is assumed that the sample of grade 1 pupils is typical of the general grade 1 population within this school jurisdiction.

3. It is assumed that each pupil's performance on the tests used in this study is indicative of his ability on the factors these tests purport to measure.

LIMITATIONS

1. Variation in the SAT scores may be due, in part, to the manner in which the individual classroom teachers have administered the test, as well as to the varying emphasis placed upon the different components of reading by the individual teachers.

2. The P/S Inventory is an experimental test. It has not been normed or widely used. Standardized responses have therefore not been made available for scoring purposes. Because of this lack of standardization, scoring results obtained by this investigator may differ somewhat from the scoring results which might have been obtained by another person.

SIGNIFICANCE OF THE STUDY

The results of this study will provide further evidence as to the effectiveness of P/S word association as a means of linking children's language performance to their reading achievement. Further this information may give some direction to the kinds of language experiences which may enhance children's reading abilities.

OVERVIEW OF THE STUDY

Chapter 1 has introduced and stated the problem, presented the research questions and null hypotheses which directed the study, defined the terms used, presented the assumptions and limitations, stated the significance of the study, and provided an overview of the entire study. Chapter 2 reviews the literature and empirical research pertinent to the problem and sketches the theoretical framework underlying this study. Chapter 3 explains the experimental design of the study with descriptions of the sample, the tests used, the pilot study, and the procedures used in the collection and analysis of the data. The results of the study are analysed and explained in Chapter 4. Chapter 5 contains the summary, conclusions, and implications of the study.

Chapter 2

REVIEW OF RELATED LITERATURE AND RESEARCH

This chapter reviews the literature and research pertinent to this study. The first section deals with the relationship between language proficiency and reading achievement. The second section focuses on discussion of the literature and research pertaining to word association as a measure of oral language output. Section three discusses the relationship of word association to reading achievement. Those findings from the literature and research relevant to this study are summarized in the final section.

THEORETICAL BACKGROUND: THE RELATIONSHIP BETWEEN LANGUAGE AND READING ACHIEVEMENT

The Literature

The process of reading is the process of deriving meaning from the printed word. If a child is able to recognize and say a word when he sees it in print, but derives no meaning from it, then he is not reading. He is, in fact, changing the code of print into another code; the code of the spoken word. But the code is not broken; it is still a code (Goodman, 1971, 1972). Reading, then, is the interpretation of writing, just as understanding is the interpretation of speech (Miller, 1969; Hildreth, 1964). The teaching of reading should therefore focus upon the processes which will enhance the child's ability to understand what is printed.

This view of the process of reading, and its implication for

the teaching of reading, is basic to this study. It is not universally shared by all writers, researchers, or teachers involved with the teaching of reading.

The underlying basis of listening, speaking, reading, and writing is language (Fagan, 1975). Language is first learned through listening, and then explored and developed through oral speech. It is by listening to and using oral language that the child learns the meanings of the individual words. He also learns that the syntactic units of phrases and sentences provide meaning greater than the individual sum of the words used in the phrase or sentence. Comprehension of the phrase or sentence, which becomes a central problem for the child, is developed mainly and primarily by the child's experience with oral language (Hildreth, 1964). Language is therefore primarily, and fundamentally, audio-lingual (Lefevre, 1961).

Written language is simply a useful byproduct of oral language. The ability of a child (or adult) to derive meaning by reading written language depends to a large degree on prior mastery of the oral language structures used to encode that meaning (Lefevre, 1961). The child from a limited oral language environment is at a definite disadvantage when learning to read (Ruddell, 1970). This is best demonstrated by the fact that the majority of deaf children, who have limited facility with oral language, are poor readers (Hart, 1975). Mather (1972) believes that language acquisition is the most important prerequisite to reading and that children should be surrounded with opportunities to use, to see, and to experiment with their own oral language prior to reading instruction.

Why is oral language development so important to reading success? Reading is a process of thinking, interpreting, and reacting, as is coherent oral speech (Artley, 1953). This process is dependent upon the child's knowledge of the syntactic and semantic structure of his language, with grapho-phonetic cues only serving as a trigger to activate this knowledge. Goodman (1967) believes the reading process begins with selective assimilation of the appropriate visual cues as determined by the reader's prior language experience. This, in turn, causes the reader to search his memory for related syntactic, semantic, and phonological cues. A perceptual image is formed by combining the selected visual cues with the syntactic and semantic memory cues to form a tentative guess as to the meaning of the print. The process of combining selected visual cues with syntactic and semantic memory cues continues as the reader creates new guesses and accepts, rejects, or modifies the old guesses to derive meaning from print. Reading is, in effect, a psycho-linguistic guessing game based on language patterns learned through using oral language (Goodman, 1967). It parallels the listening process in which the brain picks specific sounds from the general noise, constructs a perception of what is being said on the basis of these sounds, and then uses these and other selected sounds to confirm or reconstruct its original perception of what was said (Cooper, 1972). It therefore appears that a child can read no better than he can organize and express his ideas orally (Artley, 1953).

Again not all of the people concerned with investigating the reading process place such emphasis on oral language proficiency as a

prerequisite to reading. But the literature reviewed here does provide a basis for further pursuing the relationship between language and reading in this study, and for investigating research question 1.

The Research

While the theory presented in the literature reviewed thus far has decisively argued a strong relationship between oral language and reading achievement, empirical research evidence is also required to complete the case.

An early attempt to relate the role of language to reading achievement was made by Strickland (1962). She elicited and taped samples of speech from 575 children, drawn from grades 1 through 6, during interview sessions involving two or three children and an examiner. After the interview, during which the children were encouraged to talk about themselves and their experiences, the sample of language was transcribed and analysed for phonological units which she defined as units of thought separated by falling voice intonations [p. 26]. Selected units were then analysed for various syntactic patterns. The part of Strickland's comprehensive study of interest to this discussion is the relationship between the oral language of grade 6 children and their silent reading comprehension, oral reading interpretation, and listening comprehension. She found that low readers scored high on the number of short utterances while high readers used longer sentences. High readers also used more movables and subordinate elements than did low readers. The same observations resulted from comparing the oral language of grade 2 pupils to their reading scores although none of the differences noted were statistically

significant for the grade 2 pupils.

Ruddell (1965) took a slightly different approach in his investigation. He determined the patterns of language structure which occurred with high frequency in the oral language of grade 4 pupils and utilized these patterns to write three reading passages. Three other reading passages using low-frequency patterns of language were also written. These six passages were transformed into cloze comprehension tests and administered to the students. The results indicated that passages which utilize the patterns of oral language most frequently used by the students are more easily comprehended than passages which utilize low-frequency patterns.

Eighty randomly selected pairs of average and superior fifth grade males and females were screened and divided into average and superior reading groups by Jensen (1973). Drawing one person from each of the two groups to form matched pairs, she then elicited and taped the casual and careful speech of these children. This speech was then transcribed and analysed as to fluency, grammatical control, and language function. Superior readers were found to have more extensive vocabularies and to use longer communication units. She concluded that language use differentiated the subgroups more than intelligence or sex.

The three studies thus far reviewed indicate a strong link between oral language and reading ability for children in the upper elementary grades. But what of primary children?

Drake (1975) used 177 kindergarten children as her sample and applied seven different measures of reading readiness to these students:

1) teacher judgement of readiness, 2) Metropolitan Readiness Tests, 3) Draw-a-man Rating, 4) Harrison-Stroud Readiness Profiles Subtest: Auditory Discrimination, 5) Peabody Picture Vocabulary Test, 6) Sentence Imitation Task, and 7) Language Comprehension Test. By relating the other six tests to teacher judgement of readiness, two factors were isolated--a language factor, and a maturational factor. In the language factor, "Language Comprehension" and "Sentence Imitation" were the sections with the highest loading. The results of this study indicate the importance of the child's ability to comprehend and produce syntactical forms of oral language which approach adult usage as a component of reading readiness.

O'Donnell and Raymond (1972) took all the kindergarten students in Waterville, Maine, and exposed them to two different reading readiness programs. One half of the pupils were channeled into a conceptual language reading readiness program which utilized many informal experiences designed to foster concept attainment and oral language development. The other half participated in a basal reader readiness program centered around workbooks from a basal reading program as well as other workbook oriented seatwork. Both programs were in effect for twenty minutes of each instruction day with the instruction during the remainder of the day being the same for both groups. After several weeks, fifteen extra minutes per day were allotted to the basal program. After 116 days of treatment, a series of standardized tests was administered, the results of which indicated that the conceptual language program was more effective than the basal approach in preparing children for reading. However, some questions

arise with regard to this study. First, what steps were taken to ensure uniformity of teaching during the portion of the instructional day not devoted to reading readiness? Secondly, what method was used to ensure that children in the conceptual language group did not have an environmental advantage? Finally, the subjects were not followed through their grade 1 year to determine which group did best in year end reading achievement, a major concern in the present study.

Goodman (1965) studied the errors, or miscues (mispronunciations, substitutions, omissions, deletions, reversals, etc.) made by 100 children in grades 1, 2, and 3 when they were oral reading. He found that 1) children were able to read many words in context that they had been unable to read in isolation because they were able to use language cues as an aid, and 2) substitution and omission of words were often based on the spoken language model of the child. These miscues were not corrected if meaning was not affected. Goodman concluded that the reading done by the child was based firmly on his own unique model of oral language.

Goodman's results were confirmed by Forester (1975). She observed and recorded the activities that 21 first grade pupils participated in to acquire reading skills. After observing these children twice weekly over a period of a few months, she distinguished eight different patterns of behavior. Of relevance to this discussion, she found, as did Goodman, that 1) errors made during oral reading sessions frequently involve conversion of the text into a language pattern more meaningful in terms of the child's oral language, and 2) wrong intonations during oral reading often indicate that the child

draws on his knowledge of familiar language patterns to derive meaning from text. She concluded that the beginning reader seems to rely on concrete referents and on his own language patterns to deal with written language.

The syntactic versus semantic approach to analysing language.

Most of the studies reviewed thus far have analyzed oral language using measures of syntax and fluency (sentence length, total word counts, patterns of word usage, etc.). Schulte (1967) analysed the oral language of 57 second grade students for fifty different variables in much the same manner as other researchers. However she also included the variable of total different words used by each subject. Analysis indicated that 1) total different words, and 2) the use of adjectiveal, adverbial, and other subordinate clauses were the two variables which consistently discriminated between good and poor reading groups. Her findings agreed with the findings of the researchers whose literature she had reviewed. She concluded that the child's total vocabulary or his semantic knowledge affected the success of a beginning reader more than any of the other variables analysed.

Schulte's conclusion is supported by other writers. It is the quality of the talk, not the quantity that counts in developing a child's language (Cazden et al., 1972). The process of language acquisition by a child seems to follow this pattern; the acquisition of semantics followed by the more gradual acquisition of syntax to put the words together (Moe, 1975). Semantics includes more than one basic meaning for a word because the more meaningful the word, the

more easily it is retained by the child as a sight word. The greater the depth of meaning a child has for a word, the richer will be his understanding of the printed page (Artley, 1953).

The importance of the semantic component of language suggests that any method of analysing oral language output should have a strong semantic component. Research question 2 for this study was formulated to determine if P/S word association was more highly correlated to the vocabulary sub-test of reading than to the other sub-tests of reading examined by the SAT.

Summary of the Relationship between Language and Reading Achievement

The literature and studies reviewed thus far indicate a firm relationship between the oral language of a child and his future reading achievement. The child, in initial reading, will be able to orally read and understand those words which he has already mastered in his own oral language (Anastasiow, 1971). His mastery of oral language will continue to affect his reading performance as he continues through school. Measures of syntactic control using sentence length, word counts, clause patterns, etc., have been used extensively to determine the status of the child's oral language development. However some studies indicate that measures of the quantity of oral language may not be as important as the quality (vocabulary and syntactic usage) of language (Weintraub, 1968).

From this review of the literature and research, we may conclude that an accurate instrument for testing the quality of the child's oral language would be a valuable tool in shaping a program suitable for providing adequate readiness for the beginning reader

as well as continuing aid for the more advanced reader. One area of measuring oral language output which does show promise in this regard is P/S word association.

WORD ASSOCIATION AS A MEASURE OF ORAL LANGUAGE OUTPUT

Rosanoff and Rosanoff (1913) undertook one of the initial studies linking word association with language development. Using 300 randomly selected subjects ages four years to fifteen years, they found that the number of "specific" responses to the 100 Kent-Rosanoff words increases with age. They also found a definite correlation between word association and mental capacity, as well as between word association and grade in school.

Woodrow and Lowell (1916) also completed a study using word association responses to the Kent-Rosanoff list. They used 1,000 children aged 9 to 12 years and found that children's responses did not fall into the same form class as the stimulus word as often as did those of adults.

Brown and Berko (1960) hypothesized that as children become more adept at utilizing syntax in oral language, the functional syntactic similarity in words becomes more important in determining the responses children will give in a word association task. If this is so, there should be a developmental trend from heterogeneous (not of the same form class) to homogeneous (of the same form class) responses. Thirty-six stimulus words were used to elicit responses from twenty children in each of grades 1, 2, and 3, as well as from twenty adults. These responses were classified as heterogeneous and

homogeneous. Their first conclusion was that there is a developmental trend from heterogeneous to homogeneous responses. Secondly, they concluded that as the child's age increases, his homogeneous responses increase. Finally the trend from heterogeneous to homogeneous appears to be a manifestation of the development of vocabulary into syntactic classes. Research by Entwisle et al. (1964) indicates that the heterogeneous-homogeneous dichotomy is equivalent to the syntagmatic-paradigmatic dichotomy.

Ervin (1961) used twenty-three kindergarten children, ten grade ones, fifty-two grade threes, and ninety-nine sixth graders. An analysis of responses to forty-six words in a free-association test and thirty-five items in a closed-alternative test revealed a marked increase in paradigmatic responses with age, as well as a corresponding decrease in syntagmatic and clang responses.

Entwisle et al. (1964) obtained ninety-six associations from each of 500 children drawn from ages five, six, eight, and ten years. Their results duplicated the results of the previous studies mentioned. They also found that the syntagmatic-paradigmatic shift was most marked in the children aged six to eight years.

The studies thus far indicate a positive relationship between the age of the respondent and the number of paradigmatic responses to a word association task. That this relationship appears to hold true even across cultures is indicated by the fact that non-literate Navaho adults also prefer paradigmatic responses (Ervin, 1961). This increase of paradigmatic responses is not, however, strictly determined by chronological age. It is, rather, a product of increased language

maturity on the part of the older child, or adult, as opposed to the language naivety of the younger child. The association of paradigmatic responses and language maturity seems justified on the basis of a comparison of the data of Woodrow and Lowell (1916) with the data of Entwisle et al. (1964). This comparison indicates that the children and adults in 1964 generally produced more paradigmatic responses than children and adults of the same age did in 1916. The general increase in paradigmatic responses may be attributed to the increased exposure of the general population to language, both written and oral, through the mass media (Entwisle et al., 1964).

Paradigmatic-Syntagmatic Word Association as a Measure of the Syntactic/Semantic Aspects of Language Development

The question alluded to earlier in this chapter (the relative importance of the syntactic and semantic aspects of oral language) again surfaces with regard to paradigmatic-syntagmatic analysis of word association responses. Are paradigmatic responses (which are of higher quality than syntagmatic responses) a result of increased syntactic development, or are they a sign of increased semantic development?

Ervin suggested that a paradigmatic response "... might arise through similarity of referents, common affixes, or common past verbal contexts [Ervin, 1961, pp. 361]." She maintained that paradigmatic responses could be learned in two ways: forward association which would lead to the association of tea with coffee because of the repetition of "a cup of coffee" and "a cup of tea", and reverse or mediated association which would associate front with

back because of the repetition of "front door" and "back door". These associations would be made because of the "... contiguity [of the associated words] during completion of the response

[Ervin, 1961, p. 361]." This argues for a syntactical basis in the development of paradigmatic responses and, pursuing this line of reasoning one step further, would suggest that paradigmatic responses measure the syntactical development of a child's language.

McNeill (1963) attempted to verify Ervin's model of paradigmatic association of words by designing sentence frames in which pairs of nonsense words could occupy various form classes. These sentences were repeated to subjects during training sessions with each pair of nonsense words alternating in the sentences in a contiguous manner as per Ervin's theory. After the training sessions, each subject was given a free association test and the responses were classified as to paradigmatic or syntagmatic. McNeill's conclusion was that subjects could be trained to provide paradigmatic responses by this method. This, he felt, supported Ervin's model.

Deese (1964) took a stance somewhat opposed to McNeill. After analyzing the relationships among the associative distributions of the responses to 278 adjectives, he decided that the "... evidence points to the determination of intraverbal relations in meaning by partial contextual equivalence plus whatever external contingencies exist between words and the environment at large (Deese, 1964, p. 357)." Deese does not disregard the importance of syntax altogether, but he does suggest that concept formation or the linking of words to the actual environment plays an important part. This is semantics.

In 1966 McNeill reversed his stand with regard to Ervin's model of paradigmatic learning. Using essentially the same materials as previously, but varying the training method, he found that the new results did not support Ervin's model. He then went on to a second experiment in which the subjects played a language game after the initial training with the sentence frames of experiment one. On the basis of these results and after a review of previous literature, he concluded that the increase in paradigmatic responses on the part of a child is directly proportional to the number of semantic features a child can link with a word in his vocabulary. If children do not know all the semantic features of a word, they will not give the same response as an adult even though they possess the same grammatical rules as the adult. He reasoned that the most frequent paradigmatic response tends to be a word with the maximum number of semantic features in common with the stimulus and it therefore forms a minimal semantic feature contrast with the stimulus. If a child does not know a sizeable number of a word's features, the set of words that minimally contrasts with the stimulus may, for him, be so large as to include words in different grammatical classes. Hence his response is syntagmatic (Paraphrased from McNeill, 1966, p. 555).

Further evidence for semantic features as the main progenitor of paradigmatic responses is presented by Lippman (1971). Forty-eight subjects from each of kindergarten, second grade, fourth grade, and college were given a specially designed word association test. The subjects were then asked to pair words from lists and give as many reasons as possible why these were paired. After analysing the responses

from both tests, she concluded that paradigmatic responses and sufficient knowledge of the semantic features of words go hand in hand.

Words, therefore, are contrasted in terms of properties, and paradigmatic associations flow from minimal semantic contrasts between words (Entwisle, 1966).

The Relationship between the Occurrence of a Word as a Response and Its General Linguistic Use

Is it safe to generalize the association responses of a child to the child's general language usage? Howes (1957) matched the summed associative probability of a word, as measured by its total frequency in the Kent-Rosanoff tables, to its general linguistic use as measured by its frequency in the Lorge Magazine Count. He concluded that the probability of a word being produced in a word association test is the same as its probability of use in general discourse. In other words, a person's selection of words is not affected by the experimental situation.

Entwisle (1966) concurs with this observation. She also states that neither the order of words on the test nor the oral versus written aspects of the test is a factor in determining the response.

THE RELATION OF WORD ASSOCIATION TO READING ACHIEVEMENT

While some investigation of the relationship between word association and reading achievement has been done, the research in this area is not as extensive as the research linking word association and language development. Dinnan, Bickley, and Cowart (1970-71)

administered the P/S Inventory to 130 students from grades 2, 3, and 4, and the results were subjected to analysis of variance based on a high and a low group of readers as identified by the classroom teachers. The results indicated that the good readers obtained significantly higher P scores than did poor readers.

Bickley, Bickley, and Cowart (1971) related the performance of fifty-two fourth year public school pupils on the P/S Inventory to the performance of a high reading group and a low reading group as determined by the California Reading Test. They found that good readers had fewer syntagmatic responses than poor readers. Bickley, Dinnan, and Jones (1971) administered the P/S Inventory to fifty-two beginning grade 1 pupils and then split them into a high-readiness and a low-readiness group on the basis of the Metropolitan Readiness Test. The low group had significantly more syntagmatic responses than the high group. Finally, Mickleson (1972) related the number of word association responses, both paradigmatic and syntagmatic, and the reading performance of 423 nine year old children. She found a positive relationship.

While these studies do show a relationship between reading achievement and word association performance, they do not attempt to delineate which particular aspect of reading (vocabulary, word recognition, etc.) word association is most closely related to. As well, none of these studies have related word association to grade 1 reading achievement. This study will attempt to fill these two gaps in the existing research.

SUMMARY

This chapter has reviewed the literature and research relevant to the relationship between language and reading achievement, word association as a measure of oral language output, and the relation of word association to reading achievement.

The literature and research dealing with language and reading achievement indicates that the child who has a good command of oral language will learn to read more proficiently and with greater ease than will a child with a lesser degree of oral language competency. This would indicate a need for evaluating a child's oral language prior to, as well as during, his attempt to gain reading skills so that any oral language deficiencies which hinder the acquisition of these skills could be diagnosed and remediated.

Most of the oral language measures reviewed have assessed the syntactic aspect of language output. However, studies have indicated the semantic aspect of oral language may be more vital to reading achievement than the syntactic. Therefore a competent measure of oral language should measure semantic development.

Word association appears to be an indicator of the language maturity of children. In addition, when the paradigmatic-syntagmatic dichotomy of analysis is used, word association also appears to measure the child's knowledge of the semantic features of words. Some work has also been done in the area of relating word association to reading achievement. However, no attempt has been made to link word association to the reading achievement of grade 1 children. This is the age range in which P/S word association seems

to be most sensitive in measuring language maturity. Nor has any attempt been made to define the area of reading with which P/S word association is most closely correlated. These are the two concerns of this present investigation.

Chapter 3

DESIGN OF THE STUDY

The purpose of this chapter is to describe the experimental and standardized testing instruments used in the study, the selection of the sample, the pilot study, and the collection and analysis of the data.

TESTING INSTRUMENTS

Two testing instruments, the Stanford Achievement Test, Primary 1 Reading Tests, Form X, (referred to as SAT), and the Oral Paradigmatic/Syntagmatic Language Inventory (P/S Inventory) were used. The Stanford Achievement Test, a standardized reading achievement test, was used to measure the reading achievement of the sample of children used in this study. The Oral Paradigmatic/Syntagmatic Language Inventory was the experimental word association test used to determine the number of paradigmatic responses in the association repertoire of the children in the sample.

The Stanford Achievement Test, Primary 1, Form X

This test was selected as a measure of grade 1 reading ability because it is the reading achievement test routinely administered to all grade 1 pupils in the Edmonton Public School System at the end of the academic year.

Description. The Stanford Achievement Test (SAT) is a standardized reading test published by Harcourt, Brace, and World Inc., New York. It was first published in 1923 and has since undergone four revisions.

The Stanford Achievement Test, Primary 1, Reading Tests, Form X is designed mainly to be used with pupils from the middle of grade 1 to the middle of grade 2. It is composed of four separate tests: 1) Word Reading, 2) Paragraph Meaning, 3) Vocabulary, and 4) Word Study Skills.

The Word Reading test consists of a series of pictures, each of which has four words beside it. The child is required to look at the picture and then choose the word represented by the picture. The Paragraph Meaning test requires the child to read paragraphs of two to five sentences in length which have from one to three words missing, and to fill in the missing words from the list(s) of words following each paragraph. In the Vocabulary test the examiner reads a sentence and supplies words which might complete it properly; e.g., "A limb is a part of a (wall, street, tree) [SAT, Directions for Administering, p. 9]." The child then marks the appropriate choice from the list of words in his test booklet. The Word Study Skills test requires the child to "look at box 1. The words in box 1 are climb, apple, letter. Put a cross in the circle next to the word that begins with the same sound as lamp [SAT, Directions for Administering, p. 15]." This test also requires the child to match word-ending sounds.

The first two tests have a time limit of 15 and 25 minutes

respectively while the last two tests are timed by the pace of the examiner's dictation.

Reliability. The reliability data for the sub-tests mentioned (grade 1 level) are shown in Table 1.

Table 1

Reliability Coefficients and Standard Errors of Measurement
for Tests in SAT Primary 1 Battery, Grade 1

Test	Odd-Even Split Half Reliability Coefficients	Kuder-Richardson Reliability Coefficients	Standard Error of Measurement in Grade Scores
Word Reading	.85	.85	1.5
Paragraph Meaning	.90	.88	.5
Vocabulary	.79	.83	2.5
Word Study Skills	.88	.88	1.5

(Source: SAT, Directions for Administering, p. 30. These values are based on a random sample of 1,000 children from grade 1.6.)

Validity. No specific empirical validity figures have ever been available for the Stanford Achievement Tests. The SAT Directions for Administering booklet states that, "The validity of the Stanford Achievement Test is best thought of as the extent to which the content of the test constitutes a representative sample of the skills and knowledges which are the goals of instruction [SAT, Directions for Administering, p. 30]." Through the various revisions, the authors of the test have attempted to maintain consistency between the goals of instruction and the test content.

Reviews of the SAT. Bryan (1965), reviewing all levels of the SAT in the Sixth Mental Measurements Yearbook, questioned the validity of imposing time limits on tests as well as pointing out fallacies in format. But she concluded that "... the language tests remain impressive (p. 128)," and highly recommends it as an achievement test.

Traxler (1972), reviewing these tests in the Seventh Mental Measurements Yearbook stated that "the Stanford Reading Tests are the best series of reading tests now published for making annual or semi-annual surveys of reading achievement of pupils throughout the elementary school grades [p. 1103]."

Summary of reliability and validity. The reliability for the SAT in grade 1 is high. The test has face validity as is the case with competing tests. It is rated by many as the best test available for evaluating reading achievement.

Administration of the SAT in this study. The SAT was administered by each individual teacher to her own class sometime during the two week period of May 3 to May 14, 1976. The teachers handscored the tests and then forwarded the raw scores to the testing service of the Edmonton Public School Board where each student was assigned a percentile for each of the four tests, based on norms established for grade 1 pupils in the Edmonton Public School System. These percentiles were then returned to the teachers who in turn made them available to this investigator.

Percentile rather than raw scores were used because it was

easier to establish relative performance of the individual child over the four tests of the SAT.

The Oral Paradigmatic/Syntagmatic Language Inventory

This test was selected as a measure of paradigmatic-syntagmatic word association because it was a short, easily administered, and quickly scored test which had been related to reading achievement at various grade levels. However no work had been done relating it to grade 1 reading achievement.

Description. The Oral Paradigmatic/Syntagmatic Language Inventory (P/S Inventory) designed by Bickley, Bickley, and Cowart (1971) is a word association test designed, "to utilize oral language responses as a predictor of reading performance [Fagan et al., 1975]." It consists of the 30 stimulus words listed in Figure 1.

Figure 1

Words from the "Oral Pardigmatic/Syntagmatic Language Inventory"

in	high	poor
she	city	happy
go	war	hot
up	open	South
old	white	easy
day	morning	pretty
king	pay	against
life	laugh	wife
work	front	smile
father	short	foreign

The words shown in Figure 1 were compiled from the Fitzgerald and Fitzgerald list of basic communicating vocabulary. The P/S Inventory has not been standardized on any population of children.

Reliability. In a study utilizing the P/S Inventory with 52 fourth grade pupils, Bickley, Bickley, and Cowart (1971) used test-retest as a measure of reliability and obtained a correlation of .78. In the present study a test-retest procedure was also used with 26 randomly selected pupils (36%) from the original sample. The retest sample was selected by alphabetizing the pupils from each class and then picking every third one. The retesting was done on June 4, 7, and 8, five weeks after the initial testing sessions. A correlation of .913 was obtained. On the basis of the results of the two test-retest situations it would appear that the P/S Inventory is a reliable measure.

Validity. Studies arguing the validity of P/S word association as a measure of language performance have been presented in Chapter 2, and have concluded that P/S word association is a valid means of measuring language performance. Three studies have related the P/S Inventory to reading achievement. Bickley, Bickley, and Cowart (1971) compared the S scores of 52 fourth grade pupils with their reading achievement as measured by the California Reading Test. A significant ($p < .05$) t-ratio of 2.24 was obtained. Bickley, Dinnan, and Jones (1971) compared the S scores of 52 beginning first grade pupils to their Metropolitan Readiness scores. A significant ($p < .01$) t-ratio of 7.9 was obtained. Dinnan, Bickley, and Cowart (1970-71)

compared the S scores of 130 pupils from grades 2, 3, and 4 to their teacher's evaluations of their reading ability. An F-ratio of 46.9 ($p < .01$) was obtained.

On the basis of these results, the authors of the studies mentioned have concluded that a high number of syntagmatic responses is related to poor reading achievement. The P/S Inventory therefore has some validity as a measure of potential reading achievement. However further validity data utilizing a technique other than splitting the children into high and low groups according to reading achievement, and using larger, more varied samples of children in all grades is needed.

Administration of the P/S Inventory in this study. The test was administered individually to each subject. The subject was asked to listen to each stimulus word and to respond with the first word that came to mind. Responses were recorded verbatim, in written form, by the examiner. Once the test was completed by each student no further discussion about the test took place, and the subject returned to his classroom.

SELECTION OF THE SAMPLE

Grade 1 pupils were selected for the sample because the relationship between paradigmatic-syntagmatic responses to word association, and reading achievement had not been investigated for grade 1 pupils; and also because Entwistle et al. (1964) stated that "there is a definite shift from a syntagmatic response to a paradigmatic response that is most pronounced between ages six and eight [p. 28]."

A request was made to the Edmonton Public School Board for permission to test grade 1 pupils from three different schools which met the following criteria:

1. The children assigned from each school were to be heterogeneous in composition (i.e. children of all ability levels were to be found in each assigned class).

2. One school was to be in a low socio-economic area, the second in a middle socio-economic area, and the third in a high socio-economic area. The school board administration determined the socio-economic status of the schools, and their criteria were not made available to this investigator.

These criteria were used to obtain a broad, diversified sample of grade 1 children typical of a cross-section of grade 1 children in Edmonton. The results of the tests administered, as well as the geographic location of the schools assigned would indicate that these criteria were met. After selection of the sample, socio-economic status was not considered a factor in this study.

During the administration of the P/S Inventory, children who were unable to cope with the task because of difficulties with English were excluded from the sample.

Intelligence was not included as a factor in the selection of the sample. This factor was not included because intelligence screening tests are no longer routinely administered to grade 1 students by the Edmonton Public School Board. This precluded the selection and matching of high and low readers of similar intelligence. As well, some research reviewed for this study had already indicated a positive relationship between the number of paradigmatic responses produced and the intelligence of the subjects (Rosanoff and Rosanoff, 1913; Entwisle, 1966). Finally, Bickley, Dinnan, and Bickley (1970)

found a positive relationship between performance on the P/S Inventory and performance on the Otis Quick Score Mental Maturity Test. It therefore appeared that previous research had established a link between intelligence and paradigmatic-syntagmatic word association.

Number and Age of Subjects

The total number of grade 1 pupils tested was seventy. Twenty-one came from the high socio-economic school, twenty-one from the low socio-economic school, and twenty-eight from the middle socio-economic school. Of the total, thirty-four were girls, and thirty-six were boys. The average age of the seventy children tested was 82 months with the oldest being 99 months and the youngest being 74 months. The child aged 99 months was repeating grade 1. A breakdown of the number of subjects by age and sex is given in Table 2.

THE PILOT STUDY

A small pilot study was conducted in April of 1976 for the following purposes:

1. to determine if there would be a sufficient range of P scores on the P/S Inventory to permit some observation of differing abilities in grade 1 pupils.
2. to determine the types of responses to be expected of grade 1 pupils when given the stimulus words of the P/S Inventory.

Table 2

Total Number of Males and Females at
Each Age Level in the Sample

Age in Months	Male	Female	Total
99	1	0	1
92	0	1	1
91	1	0	1
88	2	0	2
86	2	1	3
85	2	6	8
84	7	5	12
83	2	4	6
82	2	2	4
81	4	1	5
80	6	1	7
79	2	4	6
78	1	2	3
77	1	2	3
76	2	4	6
74	1	1	2
Total	36	34	70

3. to develop an effective interview routine.
4. to determine the average amount of time required for each interview.
5. to devise a manageable test form (the P/S Inventory has no standardized test form).

A grade 1 class from a middle socio-economic school was used for the pilot study. The investigator initially spoke to the class as a group to explain the purpose and the general procedure of the test before interviewing each of the twenty-three students individually. The investigator walked with each individual pupil from the classroom to the testing room and chatted with the pupil to make him feel at ease. The instructions were then related to the student, and the P/S Inventory administered.

Based upon the following observations, a number of decisions about the original design of the study were made:

1. Since the P scores ranged from zero to sixteen (mean = seven) for the low reading group (as identified by the teacher) and from zero to twenty-six (mean = twelve) for the high reading group, it was decided that the P/S Inventory had some potential for differentiating pupil abilities.

2. Some pupils enjoyed the task and responded readily. Others had difficulty in associating a word to the stimulus and simply named objects in the room as a response. As well, some children gave nothing but clang responses (king--sing, in--pin, etc.) many of which were nonsense words. With pupils such as these, the investigator frequently paused during the test to explain that the response word

need not have the same ending or beginning sounds, or that the response words need not be objects visible at the time. Two pupils who had given all clang responses were immediately retested after the investigator re-explained the task, led them through the first five items in the test eliciting responses in all four of the classification categories for each word, and telling them that responses of that type were preferred. Despite this, after the first one or two responses which were syntagmatic, the students reverted back to naming objects, or to clang responses.

This led the investigator to conclude that children resorting to clang responses or naming objects did not have paradigmatic responses within their repertoire. Therefore it was decided that further instructions were not to be given during the presentation of the stimulus words.

3. The instructions to the student prior to testing were standardized.

4. The average time required per student was seven minutes. Accordingly, ten minutes per session was allotted to allow time for movement, etc.

5. The test form originally devised was found to be satisfactory.

COLLECTION OF THE DATA

Oral Paradigmatic/Syntagmatic Language Inventory

The P/S Inventory was administered to all subjects during a six day period beginning April 29, and ending May 4, 1976. All

members of a given class were tested the same day with only the regular recess and lunch breaks. The procedure followed was that used in the pilot study, with the investigator first introducing himself to the whole class and then removing each individual pupil to an unoccupied room for testing.

Reliability of scoring procedure. After the testing of all seventy subjects was completed, all the responses for each stimulus were listed. One of these lists was given to a graduate student specializing in language, who volunteered as an independent marker, and another kept by the investigator. On the basis of criteria previously compiled by the investigator, each list was then independently examined for paradigmatic responses.

A comparison of the initial two lists after independent scoring showed 59% agreement based on a total of 78 agreements and 54 disagreements. After discussion of the criteria, the independent marker and the investigator re-examined both selection lists and arrived at 97% agreement based on a total of 128 agreements and 4 disagreements. These 4 disagreements represented 4 responses out of a total of 2,100 so they were classified as syntagmatic. This final list of paradigmatic responses was then used as a scoring key for scoring the P/S Inventory.

Scoring of the P/S Inventory. After the scoring key had been finalized, it was used by the investigator to score all of the response sheets. The total number of paradigmatic responses (P score) was the final score for each student. The use of

paradigmatic responses by this investigator was a departure from the procedure devised by Bickley, et al. (1970; 1971) who used syntagmatic responses. Paradigmatic responses were used here because they represent the superior form of language response (McNeill, 1966). It was the preference of this investigator to relate the superior form of response to effective reading.

The Stanford Achievement Test

The SAT scores of the children were made available to this investigator during the second week in June. The percentile scores for each test were transcribed from a computer print-out sheet to each child's individual P/S Inventory response sheet.

DATA ANALYSIS

The data obtained were analysed according to the following statistical procedures.

1. Pearson Product-Moment of Correlation. This procedure was used to determine if a linear relationship existed between

- a) age of subjects and their P scores
- b) P scores and SAT Word Reading scores
- c) P scores and SAT Paragraph Meaning scores
- d) P scores and SAT Vocabulary scores
- e) P scores and SAT Word Study Skills.

A DEST 02 computer program was utilized for this procedure.

2. Analysis of variance. This procedure was used to determine the difference in P scores between high and low reading groups as determined by the SAT scores for each individual subtest. The

scores for each sub-test were ranked from highest to lowest and then split at the median to parallel the procedures used by Bickley, Bickley, and Cowart (1971). Analysis of variance was also used to see if any difference in P score was attributable to sex. An ANOV 15 computer program was utilized for this purpose.

3. t-test. This procedure was used to determine if there was a significant difference among the correlations obtained for 1) P score and word reading, 2) P score and paragraph reading, 3) P score and vocabulary, and 4) P score and word study skills.

Both of the computer programs used were made available through the Department of Educational Research Services, University of Alberta.

Chapter 4

ANALYSIS AND INTERPRETATION OF THE FINDINGS

In this chapter the results of the statistical analysis of the data obtained will be presented and discussed with respect to the four research questions and null hypotheses propounded in Chapter 1.

THE RESEARCH QUESTIONS

Research Question 1

Is there a significant correlation between level of performance on a P/S word association test and year end reading achievement for grade 1 pupils?

Null hypothesis 1. There is no significant correlation between the level of performance on a P/S word association test and year end reading achievement for grade 1 pupils.

Two methods of statistical analysis were used to test the relationship between the children's performance on the P/S Inventory and their performance on the SAT tests. First the relationship of the P scores to the percentile scores of the SAT was tested by means of the Product Moment of Correlation method utilizing a DEST 02 computer program. Table 3 shows the results of this analysis.

Table 3

Correlation of P Score to SAT Test Percentiles
for 70 Grade One Pupils

	P Score and Word Reading	P Score and Paragraph Meaning	P Score and Vocabulary	P Score and Word Study Skills
r	.447	.388	.570	.550

$P < .001$

To further test the relationship between P/S word association and reading achievement, the scores for each test of the SAT were ranked from highest to lowest and then divided into a high group and a low group using a median split. The high and low groups for each SAT test were then subjected to analysis of variance using the ANOV 15 computer program to determine if there was a significant difference between groups with regard to P/S word association performance. The results of this analysis are presented in Table 4.

The data presented in Table 3 indicate statistically significant positive correlations between P score and all four areas of reading achievement for grade 1 pupils as measured by the SAT. The results of the analysis of variance as presented in Table 4 also shows statistically significant differences between the P/S word association of high readers and low readers as determined by the SAT. On this basis null hypothesis 1 is rejected. Higher readers generally tend to give more paradigmatic responses while lower readers tend to give more syntagmatic responses to a word association test. This is in agreement with the results of

Bickley, Dinnan, and Jones (1971) who found that the low readiness group as defined by the Metropolitan Readiness Test had more syntagmatic responses. It also agrees with Bickley, Bickley, and Cowart (1971) who found poor readers at grade 4 level had more syntagmatic responses, and with Dinnan, Bickley, and Cowart (1970-71) who found the same results with children in grades 2, 3, and 4. A high number of paradigmatic responses on a word association test appears therefore to be related to high reading achievement in grade one pupils.

Table 4
Differences in P Score Performance
Between High and Low Groups
On the SAT Tests

	Word Reading	Paragraph Meaning	Vocabulary	Word Study Skills
Number in High Group	36	35	36	36
Number in Low Group	34	35	34	34
P Score Mean High Group	20.03	19.60	20.86	20.53
P Score Mean Low Group	13.68	14.29	12.79	13.15
F	15.35	10.08	28.74	22.51
P	.0002	.0023	.000001	.000012

Research Question 2

Is the level of performance on a P/S word association test

most significantly correlated with the word reading aspect, the paragraph meaning aspect, the vocabulary aspect, or the word study skills aspect of the reading achievement of grade 1 pupils?

Null hypothesis 2. There is no significant difference among the correlations obtained for 1) P score and word reading, 2) P score and paragraph meaning, 3) P score and vocabulary, and 4) P score and word study skills.

As indicated in Table 3, the correlations between P score and the four SAT sub-tests ranged from .388 to .570 and were statistically significant at $P < .001$. These correlations were subjected to a t-test to determine if they differed significantly. The results of this analysis are presented in Table 5.

Table 5

Significance of the Differences among
the Correlations Reported for
P scores and the Different
SAT Sub-tests

	P Score - Word Reading	P Score - Paragraph Meaning	P Score - Vocabulary
P Score - Paragraph Meaning	1.50	0	
P Score - Vocabulary	1.06	2.34*	0
P Score - Word Study Skills	1.96	2.88**	.26

*p < .05

**p < .01

The data reported in Table 5 indicate that the correlation for P score-paragraph meaning was significantly different from both P score-vocabulary and P score-word study skills. The other correlations were not significantly different. On the basis of this evidence Hypothesis 2 cannot be rejected. While the P score-paragraph meaning correlation is significantly lower than P score-vocabulary and P score-word study skills this difference might be related to the difference in the formats of the tests rather than differences in the skills examined. The paragraph meaning sub-test involved a written format whereas the vocabulary and the word study tests were oral. Because of these problems, the data do not support any conclusion about any special relationship P/S word association might have with specific sub-skills of reading.

Research Question 3

Is there a significant difference in the P/S word association performance and the reading achievement among grade 1 children of different age levels?

Null hypothesis 3. There is no significant difference in the performance of grade 1 children of different age levels in P/S word association and in reading achievement.

To test for the effect of age on grade 1 performance on both P/S word association and their reading achievement as measured by the SAT, the children in the sample were ranked in descending order of age by month, and then broken into three groups; 84 to 99 months with 28 members, 80 to 83 months with 22 members, and 74 to 79 months with 20 members. The P scores and SAT test scores were

then subjected to analysis of variance by means of an ANOV 15 computer program to determine if any significant differences existed between the three groups.

As shown by Table 6, there was no statistically significant difference in performance between the three age groups in either P/S word association or SAT test scores. On this basis null hypothesis 3 cannot be rejected.

Table 6
Effect of Age on Test Scores
for Grade One Pupils

Variable	F	P
P Score	1.66	.198
Word Reading	.38	.683
Paragraph Meaning	.49	.614
Vocabulary	.23	.791
Word Study Skills	1.44	.243

This conclusion agrees with Flamand (1961) but would seem contrary to the results of studies carried out by Woodrow and Lowell (1916), Rosanoff and Rosanoff (1913), and Entwisle (1966). However Woodrow and Lowell used a sample of 1,000 children aged 9 to 12 years, Rosanoff and Rosanoff a sample of 300 children aged 4 to 15 years, and Entwisle a sample of over 1,160 children ranging from kindergarten to fifth grade. By comparison this study used

only 70 children with an age spread of only two years. A small sample such as this along with such a narrow age range in the sample may prevent any significant differences caused by age from appearing. Furthermore, chronological age alone is not the main factor in increased paradigmatic responses. Entwistle's (1964) comparison of her results with those of Woodrow and Lowell (1916), as well as Ervin's (1963) study of Navaho word association indicate that the increased number of paradigmatic responses marks an increasingly sophisticated use of oral language. Comparison of age groups has therefore been only a convenient method of mapping increased language maturity.

Research Question 4

Is there a significant difference between the level of performance of grade 1 males and grade 1 females on P/S word association and on reading achievement?

Null hypothesis 4. There is no significant difference between the level of performance of grade 1 males and grade 1 females in P/S word association and in reading achievement.

The 70 grade 1 pupils were divided according to sex, and the P scores and SAT test scores subjected to analysis of variance utilizing an ANOV 15 computer program. The results of this analysis for 34 females and 36 males is presented in Table 7.

Table 7
The Difference of Level of Performance
as Determined by Sex

Variable	F	P
P Score	.64	.427
Word Reading	.19	.663
Paragraph Meaning	.08	.775
Vocabulary	.27	.605
Word Study Skills	.64	.425

As indicated by Table 7, the values of the F ratios do not reach statistical significance for P score or any of the SAT tests. On this basis null hypothesis 4 cannot be rejected. There are no statistically significant differences in performance on either P/S word association or on the SAT tests based on sex. This finding agrees with Entwisle (1966) who found that the form-class developmental sequence is the same for boys and girls of similar I.Q. and S.E.S. Bougere (1968) also found that sex was not an important factor in either reading achievement or language competency.

SUMMARY

This chapter has presented the results of the statistical analysis of the data and discussed these data with respect to the four research questions and the related null hypotheses which had

been propounded in Chapter 1. The analysis of the data indicated that null hypothesis 1 could be rejected but null hypothesis 2 could not. This indicated that there is a correlation between P/S word association and grade 1 reading achievement, but the evidence in this study does not support a stronger relationship between P/S word association and the sub-skills of reading as measured by the SAT.

Null hypotheses 3 and 4 could not be rejected. No evidence could be found in the data analysed to support a significant difference in P/S word association or in SAT test performance on the basis of differences in age or in sex. All conclusions resulting from the analysis of the data were discussed in terms of the relevant research previously reviewed.

Chapter 5

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

A brief summary of the study and an outline of the main findings are presented in this chapter. In addition, conclusions drawn from the findings and the implications of these conclusions for the teaching of reading are discussed. Recommendations for further research are also made.

SUMMARY OF THE STUDY

The purpose of this study was to investigate the relationship between paradigmatic-syntagmatic word association and the general reading achievement of grade 1 pupils, as well as to determine to which specific aspect of reading achievement (word recognition, paragraph meaning, vocabulary, or word study skills) paradigmatic-syntagmatic word association was most closely related. In the study, the aspects of the relationship of age and sex to P/S word association, as well as to reading achievement, were also explored.

The premise underlying this investigation was as follows. If oral language is an important factor in the achievement of beginning and advancing readers, then the oral language output of children should be assessed in some quick, convenient manner to determine at what stage the child's oral language is so that a program may be built to assist him. While most tests of oral language assess the syntactic aspect of language, various research studies indicate

that the semantic aspect of language is more crucial. Research has further suggested that paradigmatic-syntagmatic word association is a measure of semantic language development. While a relationship between paradigmatic-syntagmatic word association and reading achievement at several grade levels has been established, none of the research had investigated the relationship between paradigmatic-syntagmatic word association and grade 1 reading achievement, nor has the relationship between P/S word association and a specific aspect of grade 1 reading achievement been established.

Grade 1 pupils from three schools in different socio-economic areas were assigned to this study by the Edmonton Public School Board so that a sample of children as representative of the population of grade 1 school children in the Edmonton Public School System would be obtained. The final sample consisted of seventy grade 1 children, of whom 34 were female and 36 male. The Oral Paradigmatic/Syntagmatic Language Inventory was administered, as a measure of P/S word association, to all seventy subjects by the investigator during the period of April 29 to May 4, 1976 following a procedure tested during a pilot study conducted in April. The Stanford Achievement Test, Primary 1, Reading Tests, Form X, was administered and handscored by each individual classroom teacher during the period of May 3 to May 14, 1976. Percentiles were derived from the SAT raw scores and made available to this investigator. The ages of the subjects were obtained from the children's cumulative records which were made available by the school. These data were then statistically analysed

using a DEST 02 computer program to obtain Product Moment of Correlation, an ANOV 15 program for analysis of variance, and a t-test.

MAIN FINDINGS AND CONCLUSIONS

The relationships between P/S word association and general reading achievement, specific areas of reading achievement, age, and sex for grade 1 pupils are summarized below in relation to the questions posed in the study.

Research Question 1

The first research question asked whether or not there was any significant correlation between level of performance on a P/S word association test and general year end reading achievement for grade 1 pupils.

The correlations between P score and all four areas of reading achievement tested (word recognition, paragraph meaning, vocabulary, and word study skills) were all statistically significant at better than the .001 level of confidence. Analysis of variance on the same data using a high versus low grouping procedure based on the SAT test scores produced statistically significant F ratios at better than the .003 level of confidence. These results suggest that there is a significant relationship between P/S word association and reading achievement. It appears that as the number of paradigmatic responses increases, the general reading achievement increases. On this basis P/S word association may possibly be useful as a simple and easily administered means of assessing the oral language of the beginning, and continuing reader so that

adjustments in his oral language program might be made to assist him in maximizing his reading potential.

Research Question 2

The second research question asked with which of the four areas of reading achievement measured, word recognition, paragraph meaning, vocabulary, or word study skills, P/S word association was most closely associated. A t-test showed significant differences between P score-paragraph meaning and P score-vocabulary as well as between P score-paragraph meaning and P score-word study skills. No other correlations were significantly different. Therefore the evidence in this study does not support a stronger relationship between P/S word association and the sub-skills of reading as measured by the SAT.

Research Question 3

Research question 3 asked whether or not there would be a significant difference in levels of performance on P/S word association and reading achievement because of differences in age. Subjecting the data to analysis of variance produced no statistically significant F ratios on any of the variables among three different age groups. The number of paradigmatic responses produced on a P/S word association test, as well as reading achievement as measured by the SAT, does not appear to be affected by age. This agrees with previous research reviewed for this study.

Research Question 4

Research question 4 considered the possibility of sex being a possible factor in differing levels of performance on both P/S word association and the SAT tests. However analysis of variance produced no statistically significant F ratios. It therefore appears that both males and females are equally proficient in the production of paradigmatic responses as well as in reading achievement (as measured by the SAT). Again, this agrees with the previous research reviewed.

RECOMMENDATIONS FOR FURTHER RESEARCH

The following suggestions for further research are proposed:

1. A longitudinal study involving the testing of beginning grade 1 pupils with a paradigmatic-syntagmatic word association test such as the P/S Inventory, as well as with a reading readiness test, and then correlating the results of these tests to end of grade 1 reading achievement tests might give some insight as to the predictive value of P/S word association with regard to future reading achievement.
2. Pretesting children's paradigmatic responses and reading achievement, placing an experimental group through diverse concrete experiences while emphasizing extensive, precise oral verbalization relating to these experiences, and following this by post-testing

may determine if this type of experience would lead to an increase in paradigmatic responses and also in reading achievement. Research such as this would also determine the validity of the implications for teaching proposed in the following section of this chapter.

3. Research could be done to determine whether children actually do use paradigmatic responses as a means of translating unfamiliar written or oral language into a form of language with which they are familiar, i.e. replacing unfamiliar words with familiar words of similar meaning.

4. The paradigmatic-syntagmatic word association of high and low readers of equal intelligence should be compared to determine how closely P/S word association is related to reading achievement when intelligence is controlled.

IMPLICATIONS FOR TEACHING

Based on the findings of this study as well as those of the research reviewed, and subject to the results of the future research suggested in the previous section, the following implications for teaching are presented.

If increased paradigmatic responses and increased reading achievement go hand in hand, then it would seem likely that training children in paradigmatic word associations might be one method of increasing reading achievement. Such has not proven to be the case (McNinch, 1972; Mickelson, 1972). However Mickelson (1972) found that training in word association resulted in increased associations

for each stimulus word as well as a corresponding increase in reading achievement. Samuels (1966), and Samuels and Wittrock (1969) also found that word association training increased word recognition ability.

Why does word association training increase reading achievement while paradigmatic training does not? The language skills required for success in reading are the skills necessary for the child to manipulate language in a convergent manner. By being able to manipulate language in a convergent (paradigmatic) manner he is able to "zero in" on the meaning content of the oral language of the teacher as well as the language used in prose and poetry (McNinch, 1972). This "zeroing in" on meaning is possible because the child can pick meaningful words from his own vocabulary which will have features¹ minimally different (i.e. essentially the same as) the original words he hears or sees. In other words he obtains meaning by translating the language he sees or hears into a language he understands. This essentially is a paradigmatic action.

However, language skill such as this can be obtained only by wide exposure to as many words as possible in as many contexts (oral and written based on the child's concrete experiences) as possible so that the child can associate salient features with each word and, equally important, differentiate the features, however slight, which

¹Features refer to the linguistic features associated with each word such as animate, human, male, number, etc. Each word has a series of these features which, when taken together, make that word a unique entity. Yet, because it shares features with other words, it is interchangeable with other words. The degree of interchangeability is determined by the number of common features.

separate words from each other. Word association training exposes the child to words with similar and different features. Paradigmatic training focuses only on words with similar features. Therefore word association training is more effective than paradigmatic training in increasing reading achievement.

Paradigmatic responses appear to be an indicator of the child's inventory of semantic features, but they are, by themselves, not the essential pre-requisite to reading achievement. Therefore the learning environment should probably be set up in such a way as to permit and encourage the child to set up and test rules regarding the features of words. Word association training is a very limited, although somewhat effective method, of achieving this. Programs utilizing diverse concrete experiences and emphasizing extensive, precise oral verbalization regarding these experiences would probably prove more effective.

CONCLUDING STATEMENT

This study found that there was a significant relationship between the performance of grade 1 children on a paradigmatic-syntagmatic word association test, as measured by the Oral Paradigmatic/Syntagmatic Language Inventory, and their year-end reading achievement as measured by the Stanford Achievement Test. Generally, children giving more paradigmatic responses scored higher on all four subtests of the Stanford Achievement Test than did children giving fewer paradigmatic responses. Neither age nor sex was a significant factor in the children's performance on either

the P/S word association test or the reading achievement test.

The major implication of this study is that paradigmatic-syntagmatic word association has some utility in linking the oral language performance of grade 1 children to their reading achievement.

Several suggestions for further research, which arose from this study, were presented. As well, implications for teaching were discussed.

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APPENDIX A

Form Used For Administration of P/S Inventory

Oral P/S Language Inventory

NAME: _____ DATE OF TESTING: _____

BIRTHDATE: _____ SCHOOL: _____

GRADE: _____

SEX: _____

- | | |
|------------------|-------------------|
| 1. in _____ | 16. morning _____ |
| 2. she _____ | 17. pay _____ |
| 3. go _____ | 18. laugh _____ |
| 4. up _____ | 19. front _____ |
| 5. old _____ | 20. short _____ |
| 6. day _____ | 21. poor _____ |
| 7. king _____ | 22. happy _____ |
| 8. life _____ | 23. hot _____ |
| 9. work _____ | 24. South _____ |
| 10. father _____ | 25. easy _____ |
| 11. high _____ | 26. pretty _____ |
| 12. city _____ | 27. against _____ |
| 13. war _____ | 28. wife _____ |
| 14. open _____ | 29. smile _____ |
| 15. white _____ | 30. foreign _____ |

P Score: _____

SAT

1. Word Reading _____
2. Paragraph Meaning _____
3. Vocabulary _____
4. Word Study Skills _____

APPENDIX B

Instructions Given To The Whole Class Before Administration Of The P/S Inventory

"Good morning boys and girls. My name is Cliff Otto. I am doing some work for the University and I need your help. I would like to talk to each of you by yourself. While we are talking, I would like you to tell me what you think of when I say some words. Then I will write down what you tell me. We will be going to the _____ room to talk."

APPENDIX C

Instructions Given to Each Student Before Administration of The P/S Inventory

"Sometimes when you hear a word it makes you think of another word. For example, if I said cat, you might think of the word milk, or purr, or dog, or black. You could think of almost any word.

"I am going to say some words. After I say each word, I would like you to tell me, as quickly as you can, the first word you think of. Can you do that?

"Let's try it. If I say apple, what is the first word you think of? Arm? Branch? Dog?"

Following the word dog, the investigator immediately began to dictate the P/S Inventory words and write the responses. If the subject did not respond within approximately five seconds, the investigator proceeded to the next stimulus word. Any stimulus words with no responses were repeated at the end of the test until responses were obtained.

APPENDIX D

Criteria Used for Determining Paradigmatic Responses to the Oral Paradigmatic/Syntagmatic Language Inventory

1. The response must be a bona fide English word.
2. Responses are classified as paradigmatic if
 - 2.1. they are of the same class as the stimulus word
ie. noun, adjective, verb, etc., and,
 - 2.2. they fall within one of the following four categories of relationship:
 - 2.2.1. superordinate (apple-fruit)
 - 2.2.2. co-ordinate (arm-leg)
 - 2.2.3. contrast (white-black)
 - 2.2.4. part-whole (branch-tree).
3. The response must be one word only. However, children sometimes perceive two words which are often found together as one word, eg. red light, bread and butter, etc. Responses such as these are classified as one word.
4. The language which children would ordinarily use when speaking is accepted; e.g., the response yukky to the stimulus pretty, etc.
5. If the child responds to the homonym of the stimulus word, and that response meets the criteria for paradigmatic responses, then it is classified as paradigmatic. Example: the response bye to the stimulus high. High is the homonym to the greeting hi. Bye would therefore be classified as paradigmatic.

6. Close approximations of contrasting responses; e.g., dead as a response to life would be classified as paradigmatic. While the proper contrast would be death, dead indicates that the child has access to this particular categorization of contrast.

7. Simple sentences may be constructed with the stimulus word and then the response word may be substituted to determine if the response was paradigmatic. For example,

stimulus: I saw him laugh.

response: I saw him sad.

In this case sad would be classified as syntagmatic as sad does not maintain syntactical accuracy when substituted for laugh.

8. Responses which utilize the root word, i.e., laughing for laugh, unhappy for happy, etc., are classified as syntagmatic.

9. Responses which would logically precede or follow the stimulus word with syntactical accuracy are classified as syntagmatic.

APPENDIX E

Subjects Responses to the Oral Paradigmatic/Syntagmatic Language Inventory

(Underlined responses are those which were accepted as paradigmatic and used in scoring the P/S Inventory. A * indicates words which are not acceptable in English i.e. nonsense words.)

1. in

<u>out</u>	house	pin	can
go	you're	white	ear
door	box	whistle	pants
come	banana	bin	band
Andy	the	bun	

2. she

<u>him</u>	<u>he</u>	<u>me</u>	<u>her</u>
<u>sister</u>	nuts	<u>girl</u>	see
<u>boy</u>	likes	saw	hand
sheep	<u>mother</u>	think	shoe
white	baby	three	shot
pretty	can		

3. go

<u>stop</u>	green	no	Joe
<u>come</u>	cold	table	run
doe	way	floor	oh
out	low	now	<u>stay</u>
slow	in	red-light	fast
moon	get	gone	a lion
school	goat	on	*tro
going			

4. up

<u>down</u>	one	car	plane
*bup	cup	for	hill
jump	bunny	blue	pup
goat	shoes	in	umbrella
puff	balloon	robber	

5. old

<u>new</u>	man	drop	cold
<u>young</u>	hands	gold	lady
*dold	die	sold	not
cry	day	shoe	shy
grampa	grey	no	fun
cowboy	white	rabbit	rich
octopus	through		

6. day

<u>night</u>	may	fay	<u>week</u>
hay	light	bird	other
sun	sky	dark	shoot
man	<u>Friday</u>	fray	dad
sunny	gay	when	window
past	kay	<u>holiday</u>	nice
way			

7. king

<u>queen</u>	<u>wife</u>	key	*fing
sing	<u>princess</u>	ring	table
wing	<u>soldiers</u>	<u>castle</u>	<u>man</u>
cold	door	rich	chair
lean			

8. life

no	chair	<u>death</u>	fight
yellow	balloon	knife	pencil
way	play	journey	*tife
<u>dead</u>	nice	not	better
world	*bife	<u>die</u>	dog
white	breath	leave	nowhere
castle	nature	house	night
*mife	pole	began	swim
light	it	car	called
fine	*trife	unlike	jingle
ladder	table	*gife	<u>live</u>
light			

9. work

quiet	*burk	quit	mum
<u>play</u>	dirk	men	flag
want	not	pencil	building
don't	university	school	murk
fix	stop	fun	hammer
typewriter	dirt	black	right
no	workhood	trouble	stay
home	drive	boards	stop

word	with	brother	fire
hard	plant	*serk	worked
window	truck	finished	horse
*nerk	hurt	*herk	day
night			

10. father

<u>mother</u>	<u>mom</u>	give	<u>lurker</u>
<u>princess</u>	work	Charlie Brown	<u>dad</u>
house	fall	home	<u>children</u>
help you	wish	airplane	

11. high

<u>low</u>	<u>bye</u>	die	<u>hello</u>
mel	cry	<u>down</u>	ignore
girl	clouds	my	table
old	way	kids	sigh
car	try	milk	jacket

12. city

<u>country</u>	<u>town</u>	*fity	pity
street	drive	bitty	houses
<u>world</u>	building	<u>Calgary</u>	kitty
<u>downtown</u>	road	<u>Edmonton</u>	dog
sit	noisy	<u>farm</u>	store
*itty	man	work	hit
apartment	turkey	thirty	number
went	out	knit	<u>Alberta</u>

13. war

cold	coat	good	death
door	princess	<u>peace</u>	finished
shot	kill	for	hoar
ignore	see	bore	no
<u>battle</u>	army	gun	not
world	more	house	shooting
<u>fight</u>	terrible	mountain	dinosaur
don't	dress	airplane	cable
Japanese	Vietnam	*dee	play
life	city	chair	knives
sit	tug of war	paper	jam
<u>fighting</u>	tore	win	over
when	lemon	sad	water
dead	tomato	floor	gore

14. open

<u>closed</u>	<u>close</u>	juggle	<u>shut</u>
tree	door	*ropen	over
wide	out	side	table
no	oh	*dopen	chair
alligator	showpin	lemonade	this
box	up		

15. white

<u>black</u>	man	fight	<u>brown</u>
<u>red</u>	<u>blue</u>	dog	*dite
<u>yellow</u>	bit	want	and
<u>purple</u>	<u>color</u>	stool	sky
not	kite	table	box
boy	fright	bright	mail
paper	married	down	

16. morning

<u>night</u>	*forning	sun	light
stop	<u>day</u>	cat	town
bye	<u>goodnight</u>	dark	<u>afternoon</u>
see	new	breakfast	<u>evening</u>
<u>night-time</u>	cupboard	high	corny
cowboy	mother	umbrella	box
corning	in	<u>time</u>	*porning

17. pay

don't	grass	hay	not
hat	say	paint	gay
lay	kay	<u>charge</u>	day
dollar	play	broke	boat
thing	<u>money</u>	farm	<u>steal</u>
<u>give</u>	me	store	book
<u>free</u>	em	may	leave
door	light	<u>save</u>	soup
clay	<u>buy</u>	already	jacket
house			

18. laugh

<u>cry</u>	sad	not	calf
happy	talk	fun	stop
door	laughing	helping	pat
funny	*baff	play	I
<u>grin</u>	feeling	party	mad
color	door	gaff	paper
hair	<u>smile</u>	choke	crash
unlaughing	store	open	roof
say	half	dance	

19. front

<u>back</u>	red	door	car
cut	you	yard	shelf
stomach	bunt	water	seven
walk	*sunt	when	<u>up ahead</u>
city			

20. short

<u>tall</u>	<u>long</u>	fort	film
hook	box	car	cut
pants	<u>big</u>	<u>little</u>	man
people	slacks	<u>low</u>	coat
*mort	soap	hat	
thwart	you	aunt	

21. poor

<u>rich</u>	old	*joor	door
<u>good</u>	witch	sad	not
bur	no	ignore	princess
happy	unpoor	hoor	lady
more	apple	fast	poodle
money	new	store	suitcase
punch	pet	shore	true
pipe	kettle		

22. happy

<u>sad</u>	*dappy	<u>mad</u>	desk
lady	not	building	man
birthday	clap	nice	young
not	*mappy	wall	car
party	sappy	<u>glad</u>	spread
black	smiling	nap	

23. hot

<u>cold</u>	<u>cool</u>	fat	clock
sun	pitcher	pot	dragon
not	water	porridge	coffee
burn	tea	*mot	arm
picture	door	cot	
<u>warm</u>	dog	up	

24. south

north
roof
next
space
unsouth
lemon

east
America
valentine
wall
button
house

west
Edmonton
snow
you
far

right
* bouth
mouth
sought
winter

25. easy

hard
bike
my
nice
work
shoe

* feasy
over
try
slow
softly
* treasy

not
woe
explain
* measy
freezy

slow
busy
coat
donkey
uneasy

26. pretty

tickets
delicate
ugly
cute
doll
late
ring
window
kitty

disgraceful
birdy
dirty
girl
dog
are
fast
me
chair

yukky
lady
unpretty
nice
dull
bad
* matty
* krittty
arm

not
* fitty
flower
terrible
cat
beautiful
shoe
watch
he

27. against

woodsy
unagainst
place
o.k.
the law
nearby
hard
away from
purse
* mainst
dinner
sink
red

fence
banks
aboard
no
war
less
book
toward
fighting
hockey
behind
seven
beside

people
* afainst
down
away
wall
can
leaf
side
leave
hate
kingdom
work
hand

not
hanger
dog
window
back
lean
chair
law
light
push
lemon
come

28. wife

husband
dad
not
man
horse
ring
son

mother
child
orange
meow
girl
trife
boy

*bife
father
nice
daughter
 *dife
umbrella

fife
gentleman
four
drawer
puck
alligator

29. smile

cry
dial
face
bile
mad
sun
mile
 *sile
garbage-can

sad
funny
don't
angry
rumble
sleep
stick
unsmile

not
stop
laugh
high
grin
again
glasses
pencil

happy
frown
nice
funnyface
hair
what
laughing
grouchy

30. foreign

spoon
loud
 *goren
down
cupboard
easy
warren
against
castle
bird
think
leave
hair
corning
brown
forest

dead
dane
cat
backward
orange
blue
dogs
four
forehead
fortune
picture
garbage-can
person
unforeign
lemon
door

forward
not
happy
 *borin
red
run ahead
world
war
morning
all
shirt
 *morin
right
house
watch
 *fiven

window
bed
horn
tore
one man
book
nice
florence
jet
toward
fort
fun
orange juice
snail
name

APPENDIX F

Raw Score Results of P/S Inventory for Seventy Grade One Pupils

School	Range of Scores	Mean	Variance	Standard Deviation
1	6-27	20.905	38.086	6.171
2	1-26	12.190	61.392	7.835
3	4-24	17.536	33.106	5.754
All Schools Combined	1-27	16.943	54.711	7.397

Maximum possible score = 30.

APPENDIX G

Percentile Results of the Stanford Achievement Test for Seventy Grade One Pupils

Subtest	Range of Percentiles	Mean	Variances	Standard Deviation
Word Reading				
School 1	8-99	69.381	656.901	25.630
School 2	2-91	43.476	502.914	22.426
School 3	1-97	46.678	863.144	29.379
All Schools	1-99	52.528	816.674	28.577
Paragraph Meaning				
School 1	10-96	70.333	707.173	26.593
School 2	3-88	42.190	775.580	27.849
School 3	1-98	49.143	982.763	31.349
All Schools	1-98	53.414	968.893	31.127
Vocabulary				
School 1	1-99	77.238	504.561	22.462
School 2	4-90	35.905	676.464	26.009
School 3	1-99	57.178	1121.930	33.495
All Schools	1-99	56.814	1059.426	32.549
Word Study Skills				
School 1	10-96	64.952	834.615	28.890
School 2	2-92	38.429	471.101	21.705
School 3	1-99	47.214	853.451	29.214
All Schools	1-99	49.900	843.430	29.042

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